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of the American genus Cambarus. The species may be called, therefore, *Cambarus primævus.*—*A. S. Packard, Jr.*

ON THE SAUROPTERYGIA OF BOULOGNE-SUR-MER.—Dr. H. E. Sauvage has recently published an interesting memoir on the above subject, including in it many general remarks on the affinities and contents of the order *Sauropterygia.* He uses the results of the latest investigations on the subject, referring especially to those of Seeley. He describes several species heretofore very little known, and adds a number of new ones to Scientific Literature. Those which Dr. Sauvage finds in the Upper Jurassic beds of the Boulonnais are: *Pliosaurus gamma* Ow.; *P. grandis* Ow.; *P. suprajurensis* Sauv.; *Polytychodon archiaci* E. E. Desl.; *Plesiosaurus carinatus* Ow.; *P. phillipsi* Sauvg.; *P. morinicus* Sauvg.; *P. infraplanus* Phil.; *P. plicatus* Phil.; *P. ellipsospondylus* Ow.; *Colymbosaurus dutertrei* Sauvg.; *Muræuosaurus manseli* Hulke; *Polycotylus suprajurensis* Sauvg.

A NEW HIPPIDIUM.—A species apparently of this genus of horses has been discovered by Prof. Thomas Condon in the Loup Fork beds of Cottonwood creek, Oregon. It is represented as yet by superior molar teeth only, which are larger than those of any of extinct American horses, excepting the *Equus excelsus*, about equaling those of *Hippidium neogæum* Lund. The crowns of these teeth are very long and slightly curved, and the roots are short. The internal columns are relatively small, are subequal in size, and are flattened in outline. A peculiarity of the species is seen in the great transverse width of the lakes which, at the middle, is equal to the anteroposterior diameter. The crescents, and especially the inner ones, are correspondingly narrow. The enamel borders are simple, there being only a few notches on the adjacent faces of the lakes. One loop projects from the inner enamel border, almost reaching the anterior inner column. Cement abundant. Diameters of second premolar: anteroposterior, m. .035; transverse behind .021; height of crown .035. Diameters of a superior molar: anteroposterior, .027; transverse, do., including external ridge, .027; longitudinal externally, .045. The species of the genus heretofore described from the United States (*H. pernix* and *H. robustus*), are represented as having teeth with short crowns and long fangs, and of materially smaller size. The species may be called *H. spectans.* The teeth are about the size of those of the quagga.—*E. D. Cope.*

## GEOGRAPHY AND TRAVELS.[1]

UNITED STATES GEOLOGICAL AND GEOGRAPHICAL SURVEY OF THE TERRITORIES. WORK OF 1877–8, PRIMARY TRIANGULATION AND YELLOWSTONE PARK MAPS.—Among the posthumous works of Dr. F. V. Hayden's Survey of the Territories, there have recently appeared a series of maps, comprising most of the topographical work of the last two years, 1877 and 1878. This series comprises a sketch of the primary triangulation, and a drainage map, each covering the whole area surveyed, on a scale of eight miles to an inch, a detailed map of the Yellowstone National Park, on a scale of two miles to an inch, and three detailed atlas sheets, on a scale of four miles to an inch, The last three sheets were noticed in the number of the NATURALIST for January.

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[1] Edited by ELLIS H. YARNALL, Philadelphia.

The triangulation sheet shows the scheme of the primary triangulation, the stations, the sight lines, the closed and open triangles, the details of the expansions from the bases, and the astronomical connections.

The base lines were two in number, one near Fort Steele, on the Union Pacific railroad, Wyoming, the other in the valley of Bear River, near the village of Georgetown, Idaho. Each was between five and six miles in length, about two miles of which appear to have been measured directly, while the balance was ranged out by small, well proportioned triangles. The expansions were by means of closed triangles, and, apparently were well executed. The astronomical connections were ample, consisting of stations at Sherman and Fort Steele in Wyoming, Salt Lake City and Ogden in Utah. These points were located by the Coast Survey and by Lieut. Wheeler of the Engineer Corps. The scheme is well planned, most of the triangles being well proportioned and the only failures are unquestionably due to the incompleteness of the work, owing to the abrupt discontinuance of the survey.

Since the discovery of the wonders of the Yellowstone country, in 1870, this region has been a favorite field of exploration. Expedition after expedition has traversed it, each following much the same routes as its predecessors, and, after the first, adding but little to the sum of human knowledge regarding this strange fire-ridden region.

The explorations in this region, of the survey under Dr. F. V. Hayden, in 1871 and 1872, were singularly prolific of facts, geological, physical and geographical, and little that was new was evolved from numerous expeditions that followed. The big nuggets had been taken, and nothing but a careful, scientific, reworking of the tailings would extract from them the wealth of fine gold which they still held.

In 1878, Dr. Hayden's survey reached this region in the prosecution of its system of surveys. Its work had, years previously, passed from the reconnoissance stage to that of systematic surveys on a scale and of a degree of accuracy commensurate with the needs of the country.

In that year, a party was directed to make a detailed survey of the Yellowstone Park, its geography, geology and volcanic phenomena.

A part of the results of this season's work is now before the world, in the form of a map of the Yellowstone Park on a scale of two miles to an inch, a scale sufficiently large to show all details necessary to the geologist, or the traveler. The topography is represented by contour lines, at approximate intervals of one hundred feet. This map, as well as the others published by this survey, are admirable illustrations of relief-effect by means of contours; and they not only express the relief, but the absolute and relative elevations.

From a study of this map, we find that the greater part of the surface of the Park consists of high rolling plateaus, broken by stream beds, cliffs and cañons. Several small groups of mountains diversify the surface, among them the Red mountains, in the southern part, rising two thousand feet above the general level, or more than ten thousand feet above the sea—and the Washburn group, near the middle of the Park. This group has the form of a horseshoe, opening towards the east. The eastern border of the Park is occupied by a high, rugged range, to which has long attached the name of Yellowstone Range. Index peak; the highest measured peak in this range, exceeds 11,700 feet in height. In the north-western corner of the Park is the southern extremity of the Gallatin range, culminating in Electric Peak, a magnificent summit, 11,155 feet above the sea, which overlooks almost the whole Park.

The mean elevation of this reservation appears to be not far from 8000 feet, an elevation so great in this latitude as to presuppose an almost arctic climate. The lowest point within its limits is at the mouth of Gardiner's river, on the Yellowstone, which is 5360 feet.

Marked features of the reservation are the low, indefinite divides and the abundance of lakes and marshes. In several cases we note marshes extending across divides and making "two ocean rivers," phenomena by no means as uncommon as are popularly supposed. The lakes, principal among which are Yellowstone, Shoshone, Lewis and Heart, cover nearly 200 square miles out of the total area of the park, which is estimated at 3312 square miles.

Many newly discovered groups of hot springs and geysers appear, for the first time, on this map, among which should be mentioned the large and fine groups near the head of Gibbon's fork of the Firehole, the discovery of which has been previously noticed.

The engraving of these maps, by Bien, of New York, is one of the best specimens of his very excellent work.

## MICROSCOPY.[1]

HINTS ON THE PRESERVATION OF LIVING OBJECTS, AND THEIR EXAMINATION UNDER THE MICROSCOPE.—I will now give a short summary of the most useful apparatus for the examination of liv-

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[1] This department is edited by Dr. R. H. WARD, Troy, N. Y.